

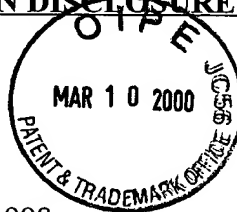
GAU 2811  
# 11/INS  
3/31/00  
NG

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

INFORMATION DISCLOSURE STATEMENT

APPLICANT: Ohsawa et al  
SERIAL NO.: 09/199,305  
DATE FILED: November 25, 1998  
INVENTION: "A SEMICONDUCTOR DEVICE AND  
AN ELECTRICAL DEVICE USING THE  
SEMICONDUCTOR DEVICE"

GROUP ART UNIT: 2811  
EXAMINER: L. Thai



Assistant Commissioner for Patents  
Washington, D.C. 20231

S I R:

In accordance with the provisions of 37 CFR 1.56, 1.97 and 1.98, it is requested that a citation and examination of the references listed on the attached Form PTO-1449 be made during the course of the examination of the above-identified application.

R E M A R K S

Applicants' attorneys have received a copy of a Search and Examination Report from the Intellectual Property Office of Singapore dated February 9, 2000 (copy attached), which included an Austrian Patent Office Service and Information Sector Report, which provided a Search Report conducted in October of 1999 by the Austrian Patent Office for the Intellectual Property Office of Singapore. This Report cited U.S. Patent Nos. 5,355,283; 5,376,588 and 5,581,122 in Category A, which is defining the general state of the art, which is not considered to be particularly relevant, and also cited European 0 371 506 in Category A. Copies of these four references are attached herewith.

It is respectfully submitted that claims 1-15 are patentable over the teachings of these references for the reasons set forth in Amendment "B", which was filed by Certificate on February 15, 2000.

RF 209C

In reply please quote our ref.

Your Ref: GM/CHV/S91-708/IR

Our Ref : 9804966-1

Date : 09/02/2000

ELLA CHEONG & G MIRANDAH

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of Singapore  
51 Bras Basah Road  
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Singapore 189554  
<http://www.gov.sg/molaw/ipos>  
Tel No. : 3302748  
Telefax : 3399230



11 FEB 2000

Dear Sirs

Patent Application No: 9804966-1  
Filing Date : 24/11/1998  
Priority date: 28/11/1997  
Applicant(s) :  
SONY CORPORATION

LYW

#### SEARCH AND EXAMINATION REPORT

The search and examination report for this application has been established and a copy of it is attached. This application will now proceed to publication in accordance with section 27 of the Patents Act (Cap. 221).

Your attention is drawn to the provisions of the Patents Act and Patents Rules (Cap. 221, R 1) for further proceedings in relation to this application.

Yours faithfully

MDM ANNIE BESANT  
for REGISTRAR OF PATENTS  
SINGAPORE



**Austrian Patent Office**  
**Service and Information Sector**  
**(TRF)**

To

**REGISTRY OF PATENTS**  
51 Bras Basah Road  
#04-01 Plaza By The Park

**SINGAPORE 0718**

Kohlmarkt 8-10  
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Austria

Tel.No.: ++431/53424/0  
Fax.No.: ++431/53424/520

Date of mailing:

**28. Jan. 2000**

Applicant: **SONY CORPORATION** (A company organised under the laws of Japan), 7-35 Kitashinagawa  
6-chome, Shinagawa-ku, Tokyo, Japan

Application No. **9804966-1**

Filing Date **24 November 1998**  
(24.11.1998)

(Earliest) Priority Date **28**  
**November 1997 (28.11.1997)**

International Patent Classification (IPC<sup>6</sup>) **H01L 23/52, 21/60**

Please find enclosed the

- ☒ **SEARCH REPORT**
- ☒ **EXAMINATION REPORT**
- ☐ **WRITTEN OPINION**

provided by the Austrian Patent Office as Search and Examination Authority according to the Memorandum of  
Understanding between the Government of Singapore and the Austrian Patent Office (MOU)

Best regards

**AUSTRIAN PATENT OFFICE**  
Service and Information  
Sector TRF

**P. NEGWER**

Telephone No.: ++431/53424/180

Enclosures:

- ☒ the search report  
(it is also accompanied by a copy of each prior art document cited in the report)
- ☒ the examination report
- ☐ the written opinion
- ☐ the Registry's copy of the priority application



# Austrian Patent Office

Application No. <b>9804966-1</b>	Applicant <b>SONY CORPORATION</b>
Filing date <b>24 November 1998 (24.11.1998)</b>	(Earliest) Priority Date <b>28 November 1997 (28.11.1997)</b>

## GENERAL OBSERVATIONS

With regard to the abstract,

- ☒ the text is approved as submitted by the applicant.
- ☐ the text has been established by this Authority as it appears on the following page.

The Searching and Examining Authority

- ☒ considers that the unity of invention is complied with the requirement of section 25 (5) of the Singapore Patents Act.
- ☐ The Searching and Examining Authority found multiple inventions in this application. This search report and this written opinion are therefore restricted to the invention first mentioned in the claims, it is covered by claims Nos.:

The Authority will establish the search (and/or examination) report(s) on the other parts of the application only if (an) additional search (and/or examination) report(s) will be requested.

With regards to section 13 (3) and (4) of the Singapore Patents Act the application contains neither statements disparaging any person nor expressions etc. contrary to morality or public order.

- ☐ The applicant is thereby invited to reply to this opinion within      months from the date of the Registrar's letter enclosing the written opinion.  
**How?** By submitting a written reply, accompanied where appropriate, by the amendments.  
**If no reply is filed**, the examination report will be established on the basis of this opinion.  
The applicant's attention is drawn to the fact that a later submission will be considered **not to have been made** and will therefore **not be taken into account**.
- ☒ Further remarks: It is recommended to insert reference signs in parentheses in the claims, especially in claims 1-5 and 11-13 to increase their intelligibility. Please use the same reference signs for the same features throughout the description resp. drawing(s).

AUSTRIAN PATENT OFFICE  
Kohlmarkt 8-10, A-1014 VIENNA  
Facsimile No. ++431/53424/535

Authorized Officer **MAYER**

Telephone No. ++431/53424/452



# SEARCH REPORT

Application No. 9804966-1

## A. CLASSIFICATION OF SUBJECT MATTER

According to the International Patent Classification (IPC<sup>6</sup>) **H01L 23/52, 21/60**

## B. FIELDS SEARCHED: IPC<sup>6</sup>

**H01L**

Electronic data base consulted during the search (name of data base and, where practicable, search terms used)

**WPI, EPODOC, PAJ, INSPEC**

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0731506 A (SHINKO ELEC IND) 11 September 1996, abstract, fig. 6. --	1-13
A	US 5581122 A (CHAO CHIEN-CHI) 03 December 1996, fig. 4A, claims 1,2,6,7. --	1-13
A	US 5355283 A (MARRS ROBERT) 11 October 1994, abstract, fig. 2. --	1-13
A	US 5376588 A (PENDSE) 27 December 1994, abstract, claims 1-3. ----	1-13

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

### \* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the filing date but later than the priority date claimed

"T" later document published after the filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of actual completion of the search: **28 October 1999 (28.10.1999)**AUSTRIAN PATENT OFFICE  
Kohlmarkt 8-10, A-1014 VIENNA

Facsimile No. ++431/53424/535

Authorized Officer **MAYER**

Telephone No. ++431/53424/452



Application No. <b>9804966-1</b>	Applicant <b>SONY CORPORATION</b>
Filing date <b>24 November 1998 (24.11.1998)</b>	(Earliest) Priority Date <b>28 November 1997 (28.11.1997)</b>

## SEARCH REPORT

### EXPLANATIONS

EP 0731506 A2: A package for semiconductor devices includes intermediate conductive patterns formed on the top of a base substrate. External terminal connecting pads are formed on the lower surface. The conductive patterns are connected to the pads by vias in the substrate. An adhesive layer adheres the lower surface of a resin film to the upper surface of the substrate. Conductors provided in through holes penetrate through the film and adhesive layer connecting conductive patterns on the upper surface of the film to the pads via the intermediate patterns.

US 5581122 A: A packaging assembly is formed on a carrier substrate which includes an integrated circuit mounting surface and a package supporting surface which is the bottom surface of the carrier substrate for supporting an integrated circuit electronic component to be mounted on a die attachment surface. The die attachment surface is formed on a copper surface formed as a thin film on the top surface of substrate. The substrate is preferably formed by the use of an insulative resin which is flexible, suitable for various thin film formation and etching processing, and has good heat dissipation characteristics.

US5355283 A: A packaged integrated circuit comprises a substrate having first and second opposed surfaces, electrically conductive first traces being formed on the first surface of the substrate. A series of electrically conductive pads extend across a portion of the substrate opposite the first surface of the substrate. A series of vias formed in the substrate each extend to one of the pads. Electrically conductive plating material is disposed on sidewalls of the vias in electrical contact with selected ones of the first traces and with selected pads. An encapsulant is formed around an electronic device attached to the first surface of the substrate so as to protect the electronic device.

US 5376588 A: A packaging process comprises: laminating a flexible circuit having a wiring pattern, an area array of outer pads and openings beneath at least one pad and traces of the wiring to a conductive substrate using adhesive, fixing an IC to the cavity of the substrate, connecting the IC to the wiring pattern, and forming solder bumps on the outer pads.



# SEARCH REPORT

Information on patent family members

Application No.

9804966-1

This annex lists the patent family members relating to the patent documents cited in the search report.  
The members are as contained in the EPIDOS INPADOC file.  
The Office is in no way liable for these particulars which are merely given for the purpose of information

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
EP A2 731506	11-09-1996	EP A3 731506 JP A2 8250827	04-06-1997 27-09-1996
US A 5591122	03-12-1996		
US A 5355283	11-10-1994	JP A2 7074281	17-03-1995
US A 5376588	27-12-1994	JP A2 6224246 US A 5468994	12-08-1994 21-11-1995



☒ EXAMINATION REPORT

Application No. 9804966-1

☐ WRITTEN OPINION

Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

## 1. STATEMENT

Novelty (N)	YES: Claims 1-13
	NO: Claims —
Inventive Steps (IS)	YES: Claims 1-13
	NO: Claims —
Industrial applicability (IA)	YES: Claims 1-13
	NO: Claims —

## 2. CITATIONS AND EXPLANATIONS

The following documents are recorded in the Search Report:

D1: EP 0 731 506 A2

D2: US 5,581,122 A

D3: US5,355,283 A

D4: US 5,376,588 A

Documents D1 to D4 show prior art methods for wiring semiconductor devices on the front surface, including intermediate conductive patterns electrically connected to the semiconductor surface by means of vias provided in the base substrate according to independent claims 1, 6 and 11.

Dependent claims 2-5, 7-10, 12, 13 show preferred realizations and details of independent claim 1 by the virtue of dependency.

Therefore, the subject-matter of claims 1 to 13 can be considered new and involving an inventive step.

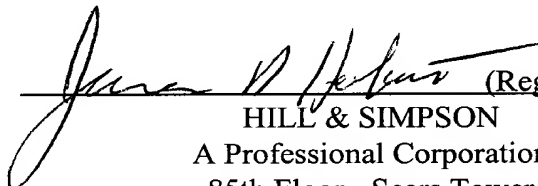
Industrial applicability is given as well.

Date of actual completion of the report / opinion 28 October 1999 (28.10.1999)



Since this Information Disclosure Statement is being filed within three months of the February 9, 2000 date of the letter from the Intellectual Property Office of Singapore in an application corresponding to the present application, it is submitted that no government fee is required under the provisions of 37 CFR 1.97(c)(1), and a Statement Under the Provisions of 37 CFR 1.97(e)(1) is attached herewith.

Respectfully submitted,

 (Reg. No. 24,149)  
HILL & SIMPSON  
A Professional Corporation  
85th Floor - Sears Tower  
Chicago, Illinois 60606

Telephone: (312) 876-0200 - Ext. 647

DATED: March 7, 2000

**CERTIFICATE OF MAILING**

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231 on March 7, 2000.

\_\_\_\_\_  
James D. Hobart  
Name of Applicant's Attorney

\_\_\_\_\_  
Signature

\_\_\_\_\_  
March 7, 2000  
Date